INCH-POUND

MIL-DTL-26499D
17 November 2003
SUPERSEDING
MIL-H-26499C
10 April 1989

DETAIL SPECIFICATION

HOSE ASSEMBLY, METAL, FLEXIBLE, BREATHING OXYGEN

This specification is approved for use by all Departments
and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers one type of breathing oxygen flexible metal hose assembly.

1.1.1 Part or Identifying Number (PIN). The definitive specification PIN will be formatted to identify each item covered by this specification. The PIN format is formatted by selecting from the requirement options available in this specification as follows:

Definitive specification PIN M26499 - XX

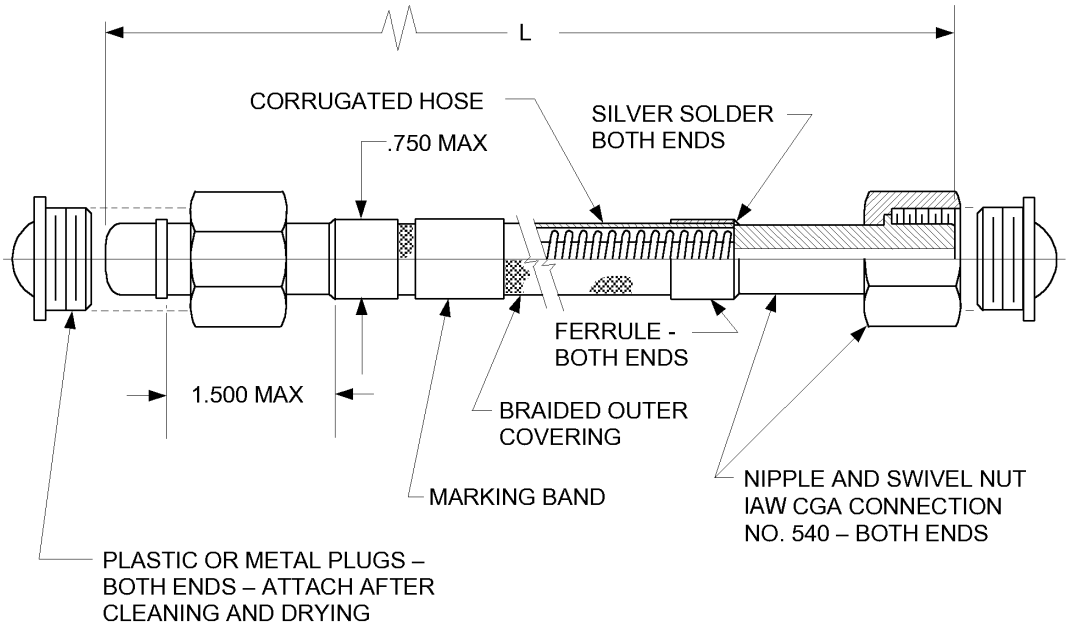
Military specification number

Length in inches (see figure 1)

Example: M26499-24 - A 24 inch hose assembly.

Comments, suggestions, or questions on this document should be addressed to: Defense Supply Center Columbus, Attn: DSCC, VAI, P O Box 3990, Columbus, Ohio, 43216-5000 or emailed to Construction@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at www.dodssp.daps.mil.

AMSC N/A FSC 4720



Inches	mm
.750	19.05
1.500	38.10

Nominal length (L)	Tolerance	Dash number
24	±.250	-24
42	±1%	-48
other	±1%	-L

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for information only.

FIGURE 1. Design and construction.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4 or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3, 4 or 5 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

FEDERAL SPECIFICATION

QQ-B-654	-	Brazing Alloys, Silver

DEPARTMENT OF DEFENSE STANDARD

MIL-STD-130	-	Identification Marking of U.S. Military Property

(Copies of these documents are available online at http://assist.daps.dla.mil/quiicksearch/ or www.dodssp.daps.mil or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, issues of these documents are those cited in the solicitation or contract.

Compressed Gas Association, Inc.

CGA-V1	-	Gas Cylinder Valve Outlet and Inlet Connections.

(Copies of these documents are available from cga@cganet.com or CGA Customer Service, 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923.)

ASTM INTERNATIOINAL

ASTM B 16/B 16M	-	Standard Specification for Free-Cutting Brass Rod, Bar and Shapes for Use in Screw Machines

(Copies of these documents are available from www.sstm.org or ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

2.4 Order of precedence. In event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Qualification. The hose assemblies furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list before contract award (see 4.4 and 6.3).

3.2 Components. The hose assembly shall consist of the following major components:

a. Corrugated hose (see 3.4.1).

b. Braided metal covering (see 3.4.2).

c. End connections (see 3.4.3).

3.3 Materials. All parts of the hose assembly shall be made of corrosion resistant metal. No materials shall be used that are toxic or give of toxic fumes, deteriorate easily, or are otherwise adversely affected by continued use with high-pressure oxygen, or that are subject to deterioration when exposed to climatic and environmental conditions likely to occur during service usage.

3.3.1 Recycled, recovered, or environmentally preferable material. Recycled, recovered, or environmentally preferable materials should be use to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.4 Design and construction. The design and construction of the hose assembly shall be specified on figure 1. Nominal lengths shall be as specified (see figure 1 and 6.2).

3.4.1 Corrugated hose. The flexible pressure carrying hose shall be helical or annular corrugated from corrosion-resistant, seamless or welded and redrawn steel tubing. The final inside diameter shall be 0.250, +0.063 inch (1.60 mm), -0.016 inch (0.41 mm).

3.4.2 Braided outer covering. The corrugated hose shall be reinforced with on or more layers of corrosion-resistant steel-wire braid.

3.4.3 End connections. A nipple and swivel nut, in accordance with pamphlet V-1, Compressed Gas Association, connection No. 540, shall be silver soldered onto each end of the hose. The nipple shank length shall not exceed 1.500 inches (38.10 mm). The nipple and swivel nut shall be made of material conforming to ASTM B 16/B 16M.

3.4.3.1 Ferrules. A hexagonal ferrule, approximately 0.500 inch (12.70 mm) long and 0.750 inch (19.05 mm) across the flats, shall be provided at each end of the hose as shown on figure 1. When held by a wrench, the ferrule shall prevent the twisting of the hose assembly during installation.

3.4.4 Silver soldering. All silver soldering operations shall be accomplished with class 4, 5, or 6 silver solder in accordance with QQ-B-654. The ferrule, corrugated hose, braided outer covering, and nipple shank shall be silver soldered together at each end of the hose assembly as shown on figure 1.

3.5 Performance.

3.5.1 Proof pressure. The hose assembly shall be capable of withstanding a proof pressure of 4,800 pounds per square inch gage (psig) without leakage.

3.5.2 Low temperature. The hose assembly shall be capable of bending, without damage, 180° around a
4-inch diameter mandrel, with the hose assembly stabilized at –65°F.

3.5.3 Vibration. The hose assembly shall be capable of withstanding vibration of 3,600 cycles per minute (cpm) without failure, while the hose assembly is pressurized to proof pressure (4,800 psig).

3.5.4 Pressure impulse. The hose assembly shall be capable of withstanding 15,000 pressure impulses from 0 to 2,400 to 0 psig without failure.

3.5.5 Hose assembly tensile strength. The hose assembly shall be able to withstand a tensile pull of 1,000 pounds without failure.

3.5.6 Burst pressure. The hose assembly shall not burst or otherwise break at any seam or junction at less than 9,600 psig hydraulic pressure.

3.6 Identification of product. The hose assembly shall be marked for identification in accordance with MIL-STD-130 as specified for parts. The marking shall be made in raised or stamped lettering on a corrosion resistant metal band permanently fastened around the braided outer covering. The following special marking shall be included on the band:

"MAX WORKING PRESSURE – 2,400 PSIG"

3.7 Workmanship. The hose shall be assembled and finished with particular attention given to freedom from blemishes, burrs, sharp edges, and thoroughness of soldering. Loose, spattered, or excess silver solder, metal chips, flux, and all other foreign material shall be removed prior to final cleaning and drying. After cleaning and drying each hose assembly shall be totally void of any petroleum residue.

3.8 Cleaning. Each hose assembly shall be cleaned of all dirt, flux, and foreign matter by flushing with a suitable solvent. All traces of the solvent shall be removed by flushing the hose assembly with a hot inhibited alkaline cleaner, then rinsed with clean water. The hose assembly shall be thoroughly dried by water pumped air or nitrogen. The ends of the hose assemblies shall then be sealed with noncombustible, noncorrosive, and nonshredding plastic plugs.

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. Qualification Inspection (see 4.4).

b. Conformance Inspection (see 4.5).

4.2 Cross-reference matrix. Table I provides a cross-reference matrix of the section 3 requirements tested or verified below.

TABLE I. Cross-reference matrix

Examination or test	Requirement	Verification	Examination or test	Requirement	Verification
Qualification	3.1	4.4.1, 4.4.2,	Proof pressure	3.5.1	4.6.3
Components	3.2	4.1.1	Low temperature	3.5.2	4.6.4
Materials	3.3	4.6.2	Vibration	3.5.3	4.6.5
Design and construction	3.4	4.6.2	Pressure impulse	3.5.4	4.6.6
Corrugated hose	3.4.1	4.3, 4.6.1	Hose assembly tensile strength	3.5.5	4.6.7
Braided outer covering	3.4.2	4.6.2	Burst pressure	3.5.6	4.6.8
End connections	3.4.3	4.6.2	Identification of product	3.6	4.6.2, 4.7
Ferrules	3.4.3.1	4.6.2	Workmanship	3.7	4.6.2
Silver soldering	3.4.4	4.6.2	Cleaning	3.8	4.6.2

4.2.1 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements specified herein and in applicable referenced documents.

4.3 Inspection conditions. The test specified in 4.6.1 shall be conducted after the hose has been cut to length, but prior to the soldering of end connection to the corrugated hose. All other tests shall be performed with the hose assembly completely assembled.

4.4 Qualification inspection.

4.4.1 Qualification inspection samples. The qualification samples shall consist of four (4) hose assemblies. Samples shall be identified with the manufacturer's part number and any additional information required by letter of authorization.

4.4.2 Qualification inspection and tests. The products, which this specification covers, shall pass qualification inspections and tests specified herein. If the product is later modified in any way, the modified form shall be subjected to and shall pass the same qualification inspections and tests. Qualification inspections and tests shall be performed by the manufacturer and shall consist of the inspections and tests shown in table II and in the order listed for each sample submitted.

TABLE II. Qualification inspection and tests.

Inspection / test	Requirement paragraph	Test paragraph
Dimension inspection	3.4.1	4.6.1
Examination of product	3.4, 3.7, 3.8	4.6.2
Proof pressure	3.5.1	4.6.3
Low temperature	3.5.2	4.6.4
Vibration	3.5.3	4.6.5
Pressure impulse	3.5.4	4.6.6
Tensile strength	3.5.5	4.6.7
Burst pressure	3.5.6	4.6.8

4.4.2.1 Failure. Failure of an article to pass any of the qualification requirements in table II shall be cause for the Government to refuse to qualify these products. Qualification of the product shall not occur until corrective action has been made and successful completion of qualification testing is accomplished.

4.5 Conformance inspection. The conformance inspection shall consist of individual inspections and tests.

a. Examination of product (see 4.6.1 and 4.6.2).

b. Proof pressure (see 4.6.3).

c. Tensile strength (see 4.6.7).

d. Burst pressure (see 4.6.8).

e. Inspection of packaging (see 4.7).

4.5.1 Individual inspections and tests. Each hose assembly shall be inspected or tested as specified below:

a. Examination of product (see 4.6.2).

b. Proof pressure (see 4.6.3).

c. Inspection of packaging (see 4.7).

4.5.2 Sampling tests. The quantities of samples selected in accordance with 4.5.4.1 shall be subjected to the following inspections and tests. Items subjected to these inspections and tests shall be discarded and not furnished as production items to the Government.

a. Dimension inspection (see 4.6.1).

b. Tensile strength (see 4.6.7).

c. Burst pressure (see 4.6.8).

4.5.3 Failure. Failure of an article to pass any of the inspections or tests specified in 4.5 shall be cause for the Government to refuse to accept further products until corrective action has been made and successful completion of the requirements of 4.5 and subparagraphs are meet.

4.5.4 Lot formation. All hose assemblies offered for delivery at one time shall be considered a lot for the purpose of inspection.

4.5.4.1 Sampling for conformance. The inspection sample shall be product selected at random from the lot without regard to quality and shall be of the size specified in table III.

TABLE III. Inspection sample.

Production lot size 1/	Sample size
2 to 8	2
8 to 15	3
16 to 25	5
26 to 50	8
51 to 90	13
91 to 150	20
151 to 280	32
281 to 500	50
501 to 1,200	80
1,201 to 3,200	125
3,201 to 10,000	200
10,001 to 35,000	315

1/ Lot size will be based on number of hose assemblies

4.6 Test methods.

4.6.1 Dimension inspection. The corrugated hose sample shall be inspected to determine if the hose inside diameter is 0.250 (6.35 mm), +0.063 (1.60 mm), -0.016 inch (0.41 mm). A corrugated hose sample not within this tolerance shall be cause for rejection of the lot.

4.6.2 Examination of product. The hose assembly shall be inspected to determine compliance with the requirements specified herein with respect to materials, workmanship, cleaning, and marking. The hose overall length shall be checked against figure 1 as applicable to the nominal length specified (see 6.2).

4.6.3 Proof pressure test. Each hose assembly shall be subjected to a hydrostatic pressure of 4,800 psig for a minimum of 3 and a maximum of 10 minutes. Clean water shall be used as the pressurizing fluid. Evidence of leakage from any part of the hose assembly shall be cause for rejection. Except for hose assemblies selected for the sampling tests or qualification test, satisfactory hose assemblies shall be cleaned, dried, and plugged in accordance with 3.8 after completion of the proof pressure test.

4.6.4 Low temperature test. The hose assembly shall be brought to a stabilized temperature of –65°F. While at –65°F, the hose assembly shall be grasped by the end connections and bent 180° around a 4-inch mandrel, after which the hose assembly shall be inspected for cracks or breaks in any component or junction.

4.6.5 Vibration. The hose assembly shall be subjected to a vibration of 3,600 cpm while pressurized to 4,800 psig. One end of the assembly shall be connected to a fixed object and the other end shall be connected to a moving object having a double amplitude of vibration of at least 0.125 inch (3.18 mm). The end connected to the moving object shall be so mounted that the central axis of the hose end is parallel to the direction of vibration. The hose shall be bent 180° during the entire test and shall be vibrated for at least 4 hours. Any sign of leakage or cracking shall be cause for rejection.

4.6.6 Pressure impulse test. The hose assembly shall be subjected to a pressure impulse cycle from 0 to 2,400 to 0 psig at the rate of approximately 1 cycle per second (cps) for 15,000 cycles. The hose assembly shall be bent 180° during the entire test. Any sign of leakage or cracking shall be cause for rejection.

4.6.7 Tensile strength test. The hose assembly shall be attached by the end connections to the heads of a tensile testing machine and pulled at the rate of approximately 1 inch (25.40 mm) per minute up to 1,000 pounds pull. Any failure below 1,000 pounds shall be cause for rejection of the lot.

4.6.8 Burst pressure test. The hose assembly shall be hydraulically pressurized from 0 to 9,600 psig in approximately 2 minutes. If any component of the hose assembly bursts or the assembly cracks at any junction, the lot shall be rejected.

4.7 Inspection of packaging. Inspection of packing, marking, and packaging shall be as specified in the contract or order (see 6.2).

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The hose assemblies covered by this specification are intended for use as flexible manifolding connections on oxygen ground servicing equipment.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.

b. Specification PIN nominal lengths of hose assemblies required, according to dash numbers shown on figure 1 (see 1.2 and 3.4).

c. Applicable levels of packaging and packing (see 5.1).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Products List (QPL-26499) whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Defense Supply Center, Columbus (DSCC-VQP), Columbus, OH 43216-5000 or email vqp.chief@dla.mil.

6.4 Subject term (key word) listing.

Breathing
Connections
Ground
Servicing

6.5 Changes for previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the change.

CONCLUDING MATERIAL

Custodians:
Army – AV
Navy – AS
Air Force – 99
DLA - CC

Preparing activity:
DLA - CC

(Project 4720-0328-000)

Review activities:
Navy – MC, SA
Air Force – 70

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online data at www.dodssp.daps.mil.